SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

23AMB201 - MACHINE LEARNING

II YEAR IV SEM

UNIT I – INTRODUCTION

TOPIC 1 – Machine Learning Process

Defining the Problem

Clearly define the problem. This lays the foundation for success. Understanding the goal guides the entire process.

1 Identify the Need

Determine the specific problem or opportunity.

2 Define Objectives

Set measurable goals for the machine learning project.

3 Scope the Project

Establish boundaries and limitations.

Data Collection and Preparation

Gather the right data. Clean and format it effectively. High-quality data fuels machine learning success.

Collect Data

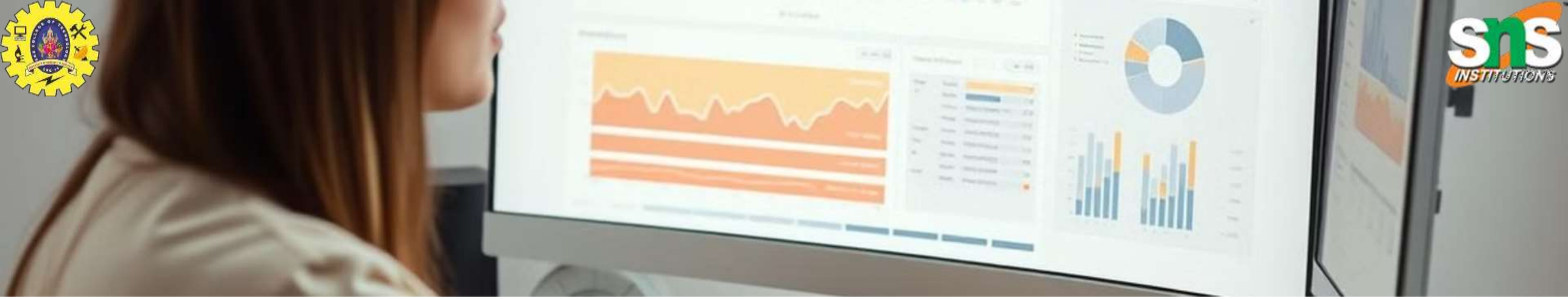
Gather data from diverse, relevant sources.

Clean Data

Handle missing values and inconsistencies.

Format Data

Transform data for model compatibility.



Feature Engineering

Extract insightful features. Transform raw data. Create meaningful inputs for the model. Refine your approach.

1

2

3

Understand Data

Analyze data to identify potential features.

Create Features

Develop new features from existing data.

Select Features

Choose the most relevant features.

Model Selection

Select the right tool. Match the model to the problem. Consider algorithms, complexity, and data.

Regression

Predict continuous values.

Classification

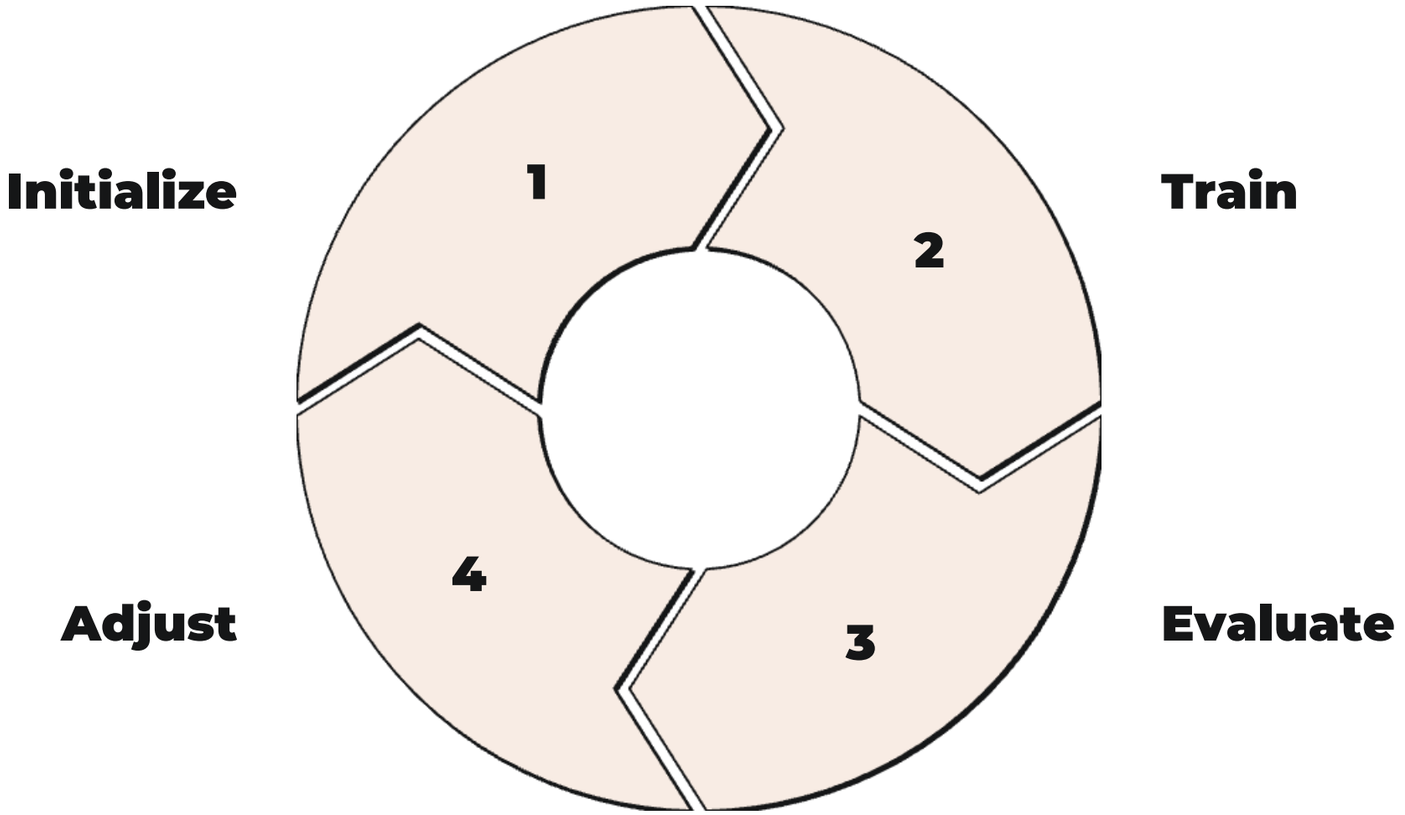
Assign categories.

Clustering

Group similar data points.

Training the Model

Feed the model data. Allow it to learn patterns. Adjust parameters for optimal performance. Iterate as needed.



Model Evaluation

Assess performance. Measure accuracy. Identify areas for improvement. Ensure the model meets requirements.

95

Accuracy

Percentage of correct predictions.

0.05

Loss

Average error rate.

80

Precision

Correct positive predictions.

Hyperparameter Tuning

Fine-tune settings. Optimize for peak efficiency. Maximize model performance. Achieve desired outcomes.

1

Grid Search

Evaluate all combinations.

2

Random Search

Randomly sample values.

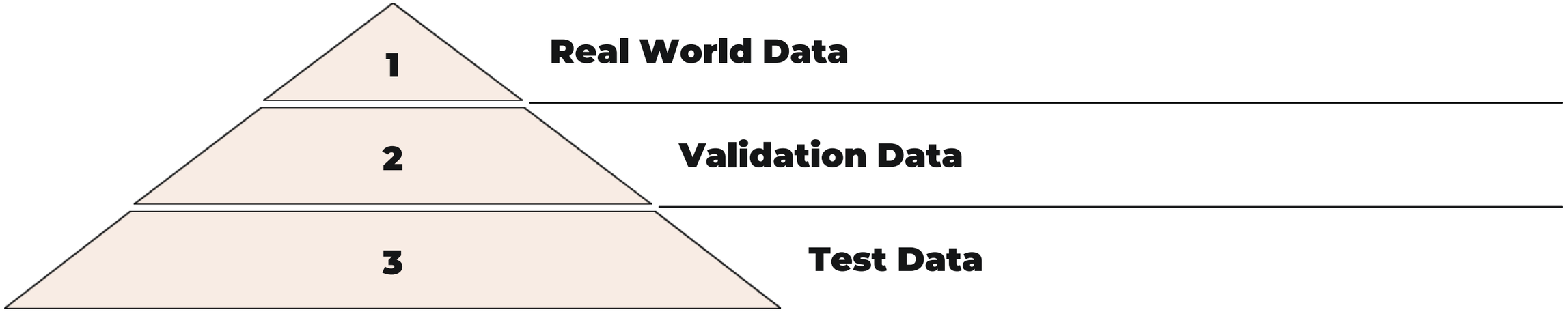
3

Bayesian

Use probability to guide search.

Testing and Validation

Ensure real-world reliability. Validate on unseen data. Confirm the model generalizes well. Prevent overfitting.



Deployment and Monitoring

Deploy the model. Deliver value. Monitor performance. Iterate to improve continuously. Stay ahead.

Deploy

Integrate into system.

Monitor

Track performance.

Iterate

Continuously improve.